

AMENDMENTS TO THE SPECIFICATION:

[0018] Negatively charged polystyrene particles were stabilized by using surfactant sodium dodecyl sulfate (SDS). This increases the mechanical stability of the future template by producing necking between the particles. The increased necking between the particles keep the structure stable during infiltration, and also during the ~~calcinations~~ calcination. These particles were used to make polystyrene opals film on a glass, Indium Tin Oxide (ITO), or Fluorine doped Tin Oxide (FTO)[[,]] ~~silicon wafer, quartz, or mica~~ substrate.

[0019] A centrifuge (~~Falcon tube~~) tube was half-filled with a diluted titanium precursor such as titanium(iv) isopropoxide (TiPT), or titanium(iv) ethoxide (TEOT) [[,]] ~~titanium(iv) butoxide, titanium(iv) tert-butoxide, titanium(iv) methoxide, or titanium(iv) propoxide~~ with anhydrous ethanol. Then the polystyrene template on a substrate was dropped into the ~~Falcon~~ centrifuge tube vertically. The degree of dilution is crucial to keep the structure of the template intact. After trying different dilution percentages it was obvious that dilution factors of less than 4 V % had little destructive effect on the polystyrene templates.

[0032] The result of this procedure is an inverted titania photonic crystal on a substrate such as glass, ITO, or FTO coated glass [[,]] ~~silicon wafer, quartz, or mica~~ substrate.